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THESIS

THE EVOLUTION OF THE
INFORMATION SYSTEMS MANAGER

by

THOMAS M. MACHAK

December, 1982

Thesis Advisor: John Senger

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The research shows that, in terms of Murray's Variables of Personality, the study group of Information Systems Managers had more in common with other managers than they did with programmers and systems analysts. Additionally, based on the results of the biodata gathered, these men shared a feeling of self-confidence and a positive outlook for the future with other menbers of the management profession.

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The Evolution of the Information Systems Manager

by

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Lieutenant, United States Navy
B.S., North Carolinia State University, 1975

Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN INFORMATION SYSTEMS

from the

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ABSTRACT

This study examines personality and biographical data gathered from a group of information systems managers in an attempt to determine if these managers are more like their subordinates or their peers. A group of thirty-seven subjects employed in high-level computer-related managerial positions completed a survey designed to measure Murray's Variables of Personality and a biodata questionnaire. The findings were compared to published results from similiar studies conducted on computer programmers and systems analysts and on other managers.

The research shows that, in terms of Murray's Variables of Personality, the study group of Information Systems Managers had more in common with other managers than they did with programmers and systems analysts. Additionally, based on the results of a biographical inventory developed to measure a perception of past success and confidence in the future, these men shared a feeling of self-confidence and a positive outlook with other management professional.

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I. INTRODUCTION

A. PURPOSE

The black arts of managerial personnel selection and career planning have been the subject of a profusion of reports, studies, theses, dissertations and text books. There are at least two reasons for this plethora of publications. First, there exists on the part of both personnel departments and individuals seeking a career in management, an insatiable demand for any information that may assist them in attaining their goals. These goals very often coincide. The personnel department's objective is to recommend the most qualified candidate for a particular job opening; the individual manager's objective is to plan his career so that when these opportunities become available, he is found to be that most qualified candidate. Second, the business of predicting managerial career success draws heavily on the field of industrial organizational psychology which, like economics, is at least as much an art as it is a science. Though varying theories abound, the exact combination of predictive factors that, when identified in an individual, will consistently guarantee that individual's managerial career success has not been found.

This thesis is not another attempt to identify that elusive combination of qualities that are necessary and sufficient for career success in the field of management. Rather it is designed to gather background and personality data from a subset of members of the management profession--senior data processing professionals. This information will be compared to and contrasted with similiar data obtained from previous studies of more junior data

processing professionals and also from earlier studies of managers from other fields. The purpose of this research is to determine if a cross-section of one representitive population of senior computer professionals possess more of the same traits and qualities of their fellow managers or if they are more like the programmers and systems analysts who work for them. If this determination can be made, personnel departments and individual managers may have a better basis for applying some of the theoretical information presented in the publications alluded to in the opening paragraph of this thesis.

B. BACKGROUND

The computer expert is probably the most maligned of all professionals. That is not to say that the computer professional is considered dishonest, or unethical or a malefactor in any way. He is rather considered to be more comfortable conversing with a machine than with a fellow human being. Those who have little or no experience with computers often view the computer professional as anything from an eccentric to a mad scientist. The following paragraphs will discuss several reasons for this misimpression.

1. Historical Basis

In fairness, there is probably an historical basis in fact for these views. In the early years of computing, before the introduction of sophisticated operating systems and CRT-equipted input/output devices, only a highly-skilled technician could hope to interact with the machine. The early computer professional had to have a total understanding of every facet of computer science. It took a very dedicated individual to develop the skills that this new profession demanded.

A hidden benefit of this required dedication was the fact that management of these individuals was almost unnecessary. Consequently, center "managers" were often simply the most senior programmer/analyst in the shop. While they were undoubtedly excellent technicians, they had little or no training or prior experience in management. Since the state of the art of computer science was advancing so rapidly, any time that they did have to devote to training was allocated to keeping current in their profession, not to improving their managerial skills. Any managerial skills that they did develop were a result of on-the-job training.

This was not a great problem in the past because there was not much of a need for management skill in the early computer centers. As mentioned earlier, programmers and systems analysts as a group are self-starters who are not motivated by their managers but by the challenges and rewards of their job. Additionally, in the early days of computing there was literally no interaction between the computer center staff and the user; the typical computer center was viewed by users as a fantasy land, fully staffed by gnomes and faieries (that is, systems programmers and analysts.) For the most part, both the center staffs and the users liked it that way. The user simply provided his data in some required format; the computer center staff did whatever work was required on the input; and they returned the finished output to the user after some pre-determined period of time had elapsed.

2. Literature Support

The literature also supports this stereotype. There have been studies, albeit a relativly small number, on the motivational factors of the computer professional. Their findings, which will be discussed later in this thesis, have

universally shown that the computer specialist would rather interact with a machine than with a co-worker.

However, in this researcher's opinion, while these generalizations may hold true for the more technically oriented computer professionals, the programmers and systems analysts, they are no longer true for the more senior people. The project manager, the ADP department head, the computer center manager and director, and other similiar positions are being filled by a new breed of computer professional, an individual whose skills have evolved over time from those of a pure technician to those of a combination of disciplines. These new professionals, these **Information Systems Managers,** still command excellent technical skills but they are also professional managers; those who succeed do so because they possess all of the qualities and skills that success in management demands.

Several factors have contributed over time to this redirection of emphasis from technical skill to managerial skill. There has been an explosive growth in the level of computer usage during the last few years. The general public is much more knowledgable on the subject and they are demanding and recieving more and more information and educational opportunities. Many high schools offer courses in the field of computer science. Most colleges and universities have computer science departments and basic computer science courses are now an undergraduate requirement of nearly all curricula at many institutions.

3. Jargon

The unique language, the jargon or the "buzz words" spoken by the computer professional further adds to his rather uncomplimentary portrait. This proliferation of "buzz words," though probably no more prevelant in the computer field than in many other professions, exaggerates

the image of complexity that is often associated with computer science.

Unfortunatly, the specialized language is unavoidable; the technology has outstripped the english language; words simply do not exist for many of the developments that are being made on a daily basis. Advances in the state of the art are occuring at such a rapid pace that even computer professionals have some difficulty keeping up with the new terminology in areas outside of their immediate specialty.

The good news is that the very advances that caused the "buzz words" to flourish have also contributed to the shattering of the computer's mystique of complexity. The primary breakthrough was the Large Scale Integration (LSI)[1] technology of the mid 1970's. This development drove the cost of hardware down and enabled computer engineers and software developement experts to devote more time to the science of ergonomics and the resulting production of todays "user friendly" computers. This falling cost resulted in the predictable increase in demand for microcomputers and other microprocessor controlled products. The current popularity of the so-called "personal computer" is an excellent illustration of this increased demand. The personal computer market of today is analogous to the television market of 1947 in which manufacturers were simply unable to meet the demand for thier product. There is no question that a similiar buying boom is on the horizon for the burdgening microcomputer industry.

---

[1] Integrated circuits containing 100 or more discreet components per 1/5 inch square silicon chip. This technology has advanced through Very Large Scale Integration (VLSI) to Super Large Scale Integration (SLSI) and beyond to the point where today complete mass-produced computers providing all the computing power of the room-sized multi-million dollar machines of a few years ago can be held in the palm of one's hand and purchased for less then fifty dollars.

As computers come into our homes, the casual computer user is becoming more familiar with electronic data processing principles and terminology. Because of this increased familiarity, today's user knows the capabilities of his systems, both at home and at the office, and he expects his computer center to provide timely service at a reasonable price.

C. OBJECTIVE

Viewed from this perspective, there is reason to question the universal application of the aforementioned studies of computer professionals. Most of these studies concentrated on programmers and systems analysts; very little has been written on the relativly new field of Information Systems Management. Though the findings of these earlier studies may still apply to programmers and, to a lesser extent, to systems analysts, the objective of this thesis is to show that the traits indicated by these studies can not be unequivocally cited as the primary motivating factors in the senior data processing professional's personality.

The computer professional's dedication and excellent technical skills indicated by this earlier research are fine qualities but they are simply not sufficient for the job of running a modern computer center. Modern industrial computer centers can no longer be considered merely support activities; in many cases the computer center is the very heart of the organization. In addition, a large computer center budget can run into hundreds of thousands of dollars and the center director and managers must possess some measure of managerial talent in order to ensure that the organization operates in a cost effective fashion.

At least one text speaks of a "new era" of computer system management marked by this concern for cost effective operation [Ref. 1]. The authors cited several examples of the capabilities that mini and microcomputer manufacturers have demonstrated for their products, one example given was the growing use of these small inexpensive machines for controlling the efficient teleprocessing of information over computer-controlled communications networks. While praising these new advances, the authors bemoaned the fact that these resources are often wasted due to the fact that new releases of applications software are not being written to utilize all of the capabilities of these devices. Instead, the short-sighted approach of re-writing systems software to allow the old applications to run on the new system is too often taken. This is clear example of the questionable management decisions that are being made throughout the data processing industry today.

To reiterate, today's information system director must possess some managerial skill as well as technical ability. He must be able to manage the entire computer system and all that that implies including:

1. System growth
2. Hardware and software maintenance
3. Computer center economics
4. Personnel management
5. User relations

The senior computer professional of today can no longer expect his user to sit quietly outside of the computer center and accept whatever service is offered.

D. SCOPE

This thesis neither attempts to describe nor give a personality profile of the "successful" information systems manager. It also does not provide a listing of traits that should be required of prospective senior computer professionals. It is simply a snapshot of the common personality traits exhibited by a small cross-section of individuals currently employed in this field as measured by two standard survey instruments.

Unfortunatly, this research is limited to male information systems managers because of the low response received from senior female computer professionals. It may be worth noting that, due to the relative youth of the computer field, there is probably less sexual discrimination present in this field than there is in some of the more traditional branches of management. For this reason it should be a very fertile area for the study of the female business manager.

II. LITERATURE REVIEW

A. OVERVIEW

A search of the literature yields a relatively small number of studies on the personality characteristics of data processing people. This is not suprising. With the exception of one or two occupational groups, perhaps law enforcement officials and educators, very little definitive information has been published on this subject for any profession. Many researchers have cited this lack of published material. As Douglas Bray said in his study of AT&T executives [Ref. 2: p. 1],

> Students of human behavior have mapped the earlier years of life with painstaking thoroughness. We know the exact age, in weeks at which the average infant will be able to pick up a cube by opposing his thumb and forefinger, and we know the importance for later personality development of parental behavior during the child's early years. The processes by which children learn in school have been the subject of countless experiments.
>
> We know much, therefore, about the preparatory period of life, but when the individual emerges from the high school or college into what we might call the performance period, we quickly run out of knowledge.

Bray listed some possible reasons for this. He mentioned the difficulties involved in following a population after it leaves the structure of the college campus. He questioned the existance of any suitable criteria for the measurement of "success." He also alluded to the problems of assuring the privacy of study participants.

Bray did not mention the possibility that the shortage may not be of studies but of published studies. It is quite possible, in fact it is likely, that studies have been conducted but the results not published because they were

inconsequential, contained proprietory information, or were not well presented. In any case, while theories abound, there is not much definitive information available on the subject.

The studies cited in this research on data processing professionals were the only ones found after a rather exhaustive search. Those cited on managers from other fields were the ones found to be best suited for comparison because of the survey instruments used and the manner in which the data were presented.

B. DATA PROCESSING PERSONNEL

The stereotypical data processing professional, as described in papers by Couger and Zawacki, Fitz-ens, and Woodruff, is a relatively passive individual who displays a high need for Endurance, Achievment, Cognitive Structure, and Harm Avoidance, while showing a low need for Affiliation [Ref. 3, 4, and 5].

1. The Couger Study

Couger and Zawacki surveyed more than 600 analysts, programmer/analysts, and programmers using the Hackman/Oldham Job Diagnostic Survey (JDS) which is based on Herzberg's theory of job satisfaction [Ref. 6], and may be compared to Maslow's hierarchy of needs [Ref. 7: pg. 276]. Their intent was to determine what motivates the data processing professional and to compare these motivational factors to the results of similiar studies conducted on other professionals. They found that, in general, programmers and analysts exhibited the lowest social needs and the highest growth needs of any of the job catagories surveyed by Hackman and Oldham. Systems specialists in particular displayed a "startlingly low" need for social

interaction while displaying a correspondingly high need for personal growth.

2. The Fitz-Enz Study

Fitz-enz found a large group of people who held the opinion that computer programmers:

1. Prefer to work in isolation
2. Avoid contact and any confrontation with others
3. Prefer an unstructured environment
4. Are motivated by achievement and not recognition

Opinions such as these prompted him to conduct research into the nature of the computer professional. Fitz-Enz, like Couger, used a survey/questionnaire designed to correlate with Herzberg's "Hygienes" and "Motivators." He collected data from more than 1500 subjects drawn from a variety of computer related industries, occupations and job levels. These data did reveal the high achievement and growth needs and low recogntion and interpersonal relation needs that would support generalizations such as those listed above.

3. The Woodruff Study

Woodruff undertook a similiar study of 202 operations personnel, programmers, programmer/analysts, and systems analysts, 152 of whom were men. While the population Woodruff chose for his study was similiar to those of his predessors, the items he elected to measure were quite different. To that end, the test instrument he selected was the Personality Research Form, Form AA, which was developed by Douglas N. Jackson to measure Murray's Variables of Personality.[2] As shown in Figure 2.1, which has

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[2] Appendix A to this thesis is a comparison of Murray's

been adapted from Reference 5, Woodruff's study indicated a significantly higher need for Endurance in men employed in the computer field when compared to general population

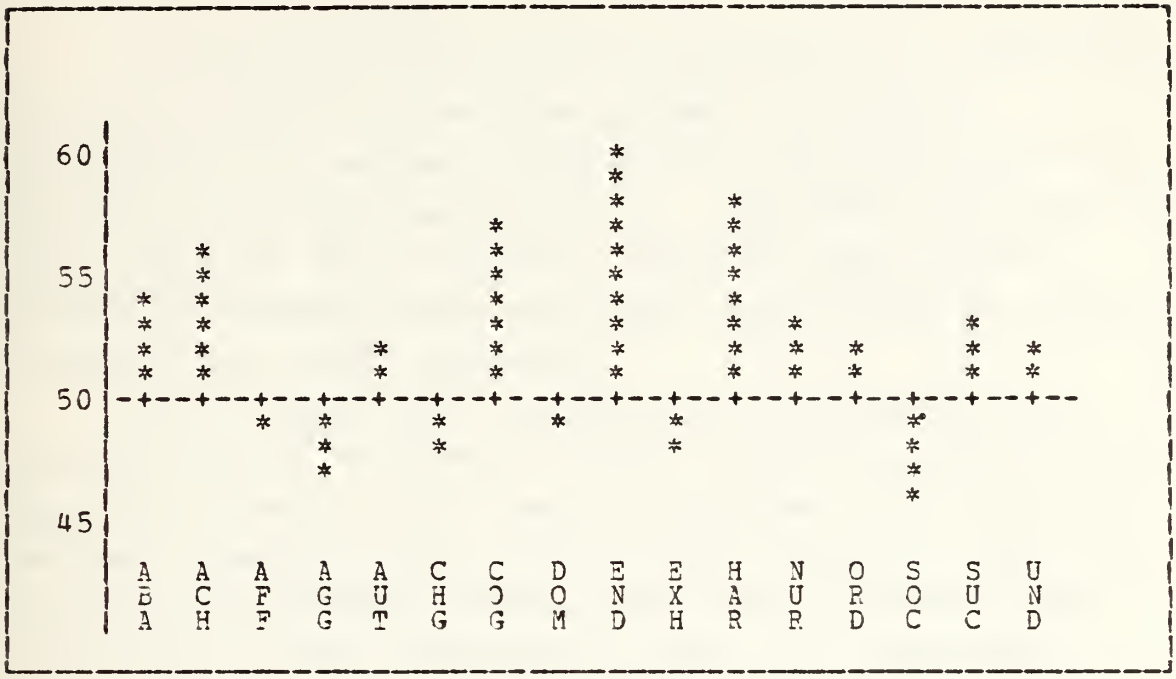

Figure 2.1 DP Males Personality Needs Profile.

males. This supported Woodruff's intuitive beliefs based on his observations of programmers' and systems analysts' work habits.

Other findings included higher needs for Achievement, Cognitive Structure, and Harm Avoidance in programmers and systems analysts versus the norm. Woodruff hinted at the possible significance of the high Achievement need in particular. In his view, this need could be channeled, through an appropriate set of performance objectives, to cue achievement-oriented behavior.

Variables of Personality as originaly defined by Murray, and as purportedly tested by the Personality Research Form and by the Edwards Personal Preference Schedule.

> Coupled with concomitant tasks of a challenging nature, such individuals can be expected to exhibit behaviors reflective of high levels of effort provided that valued rewards are achievement-related and are of sufficient magnitude and importance to the individual [Ref. 5: p. 136].

He explained the Cognitive Structure and Order needs as being a result of the large volumes of computer architecture and software information that programmers and analysts have become acclimated to. Woodruff theorized that since these men were so used to absorbing such massive amounts of technical data they were less willing to accept ambiguity than other personnel.

At the same time, according to Woodruff's study, these men showed "noticeably lower" Aggression and Social Recognition needs, and a need for Abasement that was above the norm. Woodruff interpreted these findings to mean that these men are somewhat humble, not easily offended, and prefer not to take a leadership role in the organization.

C. DATA PROCESSING MANAGERS

At least one study exists on the motivation of a group of senior computer professionals, specifically, Management Information System (MIS) Managers. Couger, Zawacki, and Oppermann, using a version of the Hackman/Oldham Job Diagnostic Survey tailored to the data processing profession, studied more than 800 MIS managers [Ref. 8]. Building on an earlier study, they hypothesized that MIS managers were significantly different from managers in other professions.

They found data that supported their hypothesis. Like the programmers and analysts in the earlier study, MIS managers exhibited the highest growth needs of any of the job catagories surveyed by Hackman and Oldham in their pioneering study, and social needs lower than any other group except systems analysts and programmers. Based on

these findings, Couger and his associates unequivocally stated that "MIS managers possess characteristics more similar to those of their subordinates than of their managerial peers."

Couger and the others based this assertion on findings concerning Herzberg's theories. While this researcher does not argue with Couger's findings, he contends that personality and motivation are a function of much more than merely growth and social needs. Chapter III of this thesis addresses the subject of personality in some detail and proposes a different definition than the one Couger used.

D. MANAGERS

This thesis will discuss the findings of several seperate research efforts concerning the personalities and motivations of managers: Bray, Campbell and Grant's long-term study of AT&T managers, Rawls and Rawls' study of public utility executives, and Harrell and his associate's series of studies on seven classes of Stanford University Business School graduates, [Ref. 2, 9, and 10-15].

1. The AT&T Study

Bray, Campbell, and Grant's study focused on 274 male college graduates who were successfully recruited by five different AT&T subsidiaries. The subjects participated in an assesment center program; they underwent intensive interviews; and they completed questionnaires concerning their attitudes and expectations. One purpose of the study was to determine if these initial attitudes and expectations remained constant or if they changed as a function of age and experience. To this end, the subjects were retested at regular intervals. The initial published report of the study centered on the findings yielded from the first eight years of the project [Ref. 2].

One of the questionnaires used in the study was the Edwards Personal Preference Schedule (EPPS). This instrument, developed in the 1950's by Allen Edwards of the University of Washington, uses 225 forced-choice questions to measure an individual's manifest needs for fifteen of Murray's Variables of Personality.

After eight years at AT&T, when compared to a normative group, the typical AT&T manager demonstrated a significantly higher need for Achievement, Dominance, and Heterosexuality and a need for Exhibition and Change that was above the norm as defined by the EPPS. Using the same measure, they indicated a significantly lower need for Abasement and a need for Deference, Order, Affiliation, Succorance, Nurturance, and Endurance that was below the norm. Appendix A of this thesis provides definitions of these personality variables as purportedly measured by this test instrument.

In order to display the comparison between Bray's subjects and the norms established for the EPPS more clearly, a score of fifty was arbitrarily assigned as a norm to each of the fifteen measured personality variables. This standard score was divided by the general adult population mean scores that were provided in the EPPS Handbook for each of the fifteen items. The resultant quotients were established as seperate conversion factors for the various personality variables. Finally, the mean scores achieved by Bray's subjects in each of the fifteen catagories were multiplied by the conversion factor defined above. The resulting converted scores are graphicly depicted in Figure 2.2.

Bray and his associates further disaggregated their findings, separating those who achieved middle management within their first eight years with AT&T from those who did not. As shown in Figure 2.3, when compared to each other

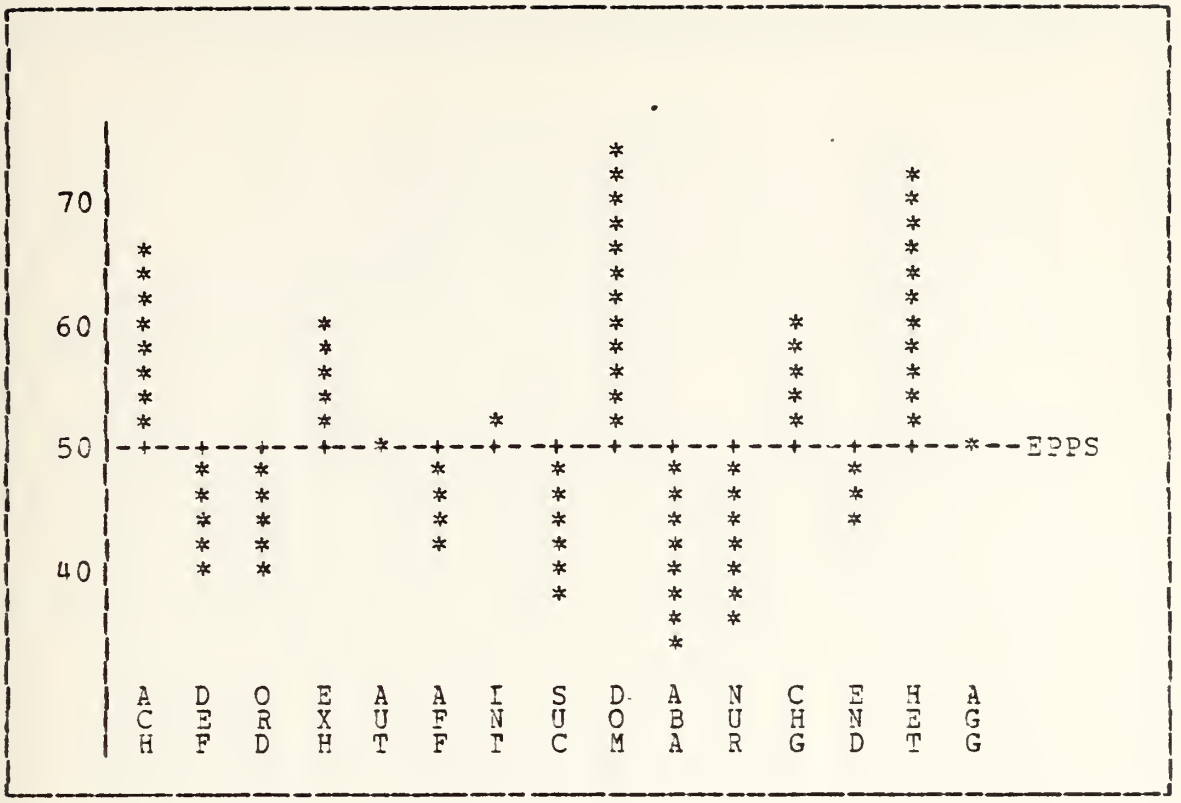

Figure 2.2 AT&T Managers Personality Needs Profile.

using Edwards' published general adult male findings as a norming tool, the more successful managers, the "fast starters", scored slightly higher on the Achievement, Autonomy, Heterosexuality, and Aggression scales while those who failed to achieve middle management in that period of time, the "slow starters", scored slightly higher in the Exhibition, Affiliation, Intraception, Nurturance, and Change scales.

In an attempt to accentuate the differences between the two groups, this researcher reconstructed the figure using the scores achieved by the managers who achieved middle management early as the norming tool. The resultant graph is given as Figure 2.4. This figure shows not only the differences in direction of the manifest needs of the

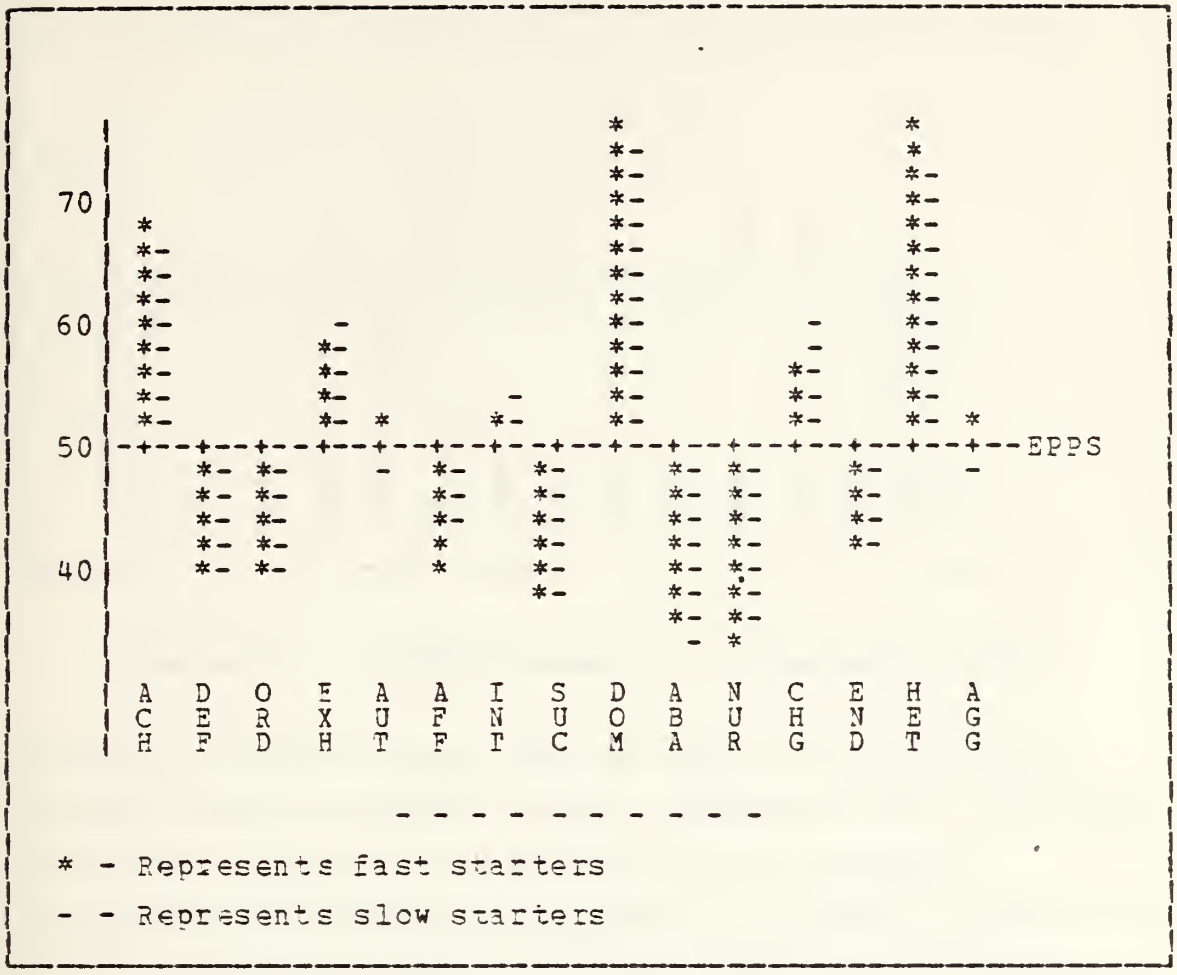

Figure 2.3 AT&T Managers: Fast Starters vs. Slow Starters.

two groups of managers, but also the magnitude of the differences. These differences do not appear to be significant. The "slow starters" scored slightly higher on the Affiliation, Intraception, Nurturance, and Change scales while the "fast starters" scored slightly higher on the Achievement, Autonomy, Heterosexuality, and Aggression scales.

In fact Bray and his associates considered the fifteen EPPS scores and seventeen ratings and scores from other instruments designed to measure personality traits, to

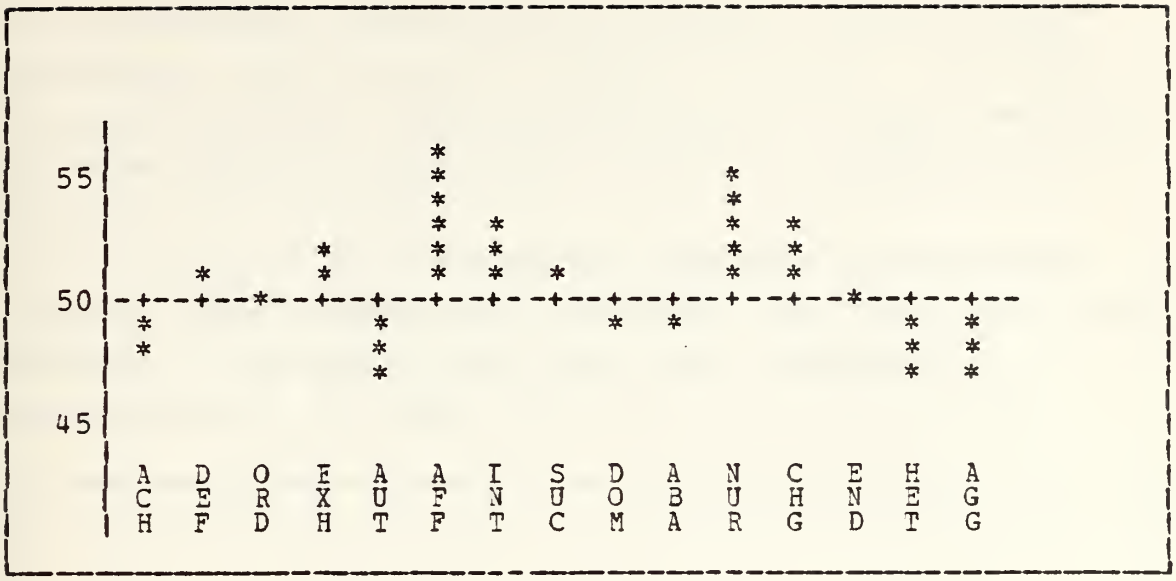

Figure 2.4 AT&T Managers: an Alternative View.

determine if any of them could be used to discriminate between those who reached middle mangement early and those who did not. Only two of the thirty-two measures considered, the assesment variables of Primacy of Work, and Goal Flexibility, demonstrated any significant differences between the two groups.

2. The Public Utility Study

Rawls and Rawls used the Edwards Personal Preference Schedule, the California Psychological Inventory, and a specially constructed biographical information blank in their study of 60 executives employed by a medium-sized southern public utility. The executives that they judged successful on the basis of salary level, job title, performance ratings, and background information scored significantly higher on the Aggression, Dominance and Heterosexuality scales of the EPPS and on the Dominance, Capacity for Status, Sociability, Social Presence,

Self-acceptance, Intellectual Efficiency, Psychological-mindedness, and Flexibility scales of the CPI. The less successful managers achieved significantly higher Deference and Order EPPS scores and self-control and femininity CPI scores.

Figure 2.5 is a stylized depiction of the Rawls' findings. The reader should note that the actual raw scores achieved on the EPPS by the individual managers who participated in the Rawls study were not given in the

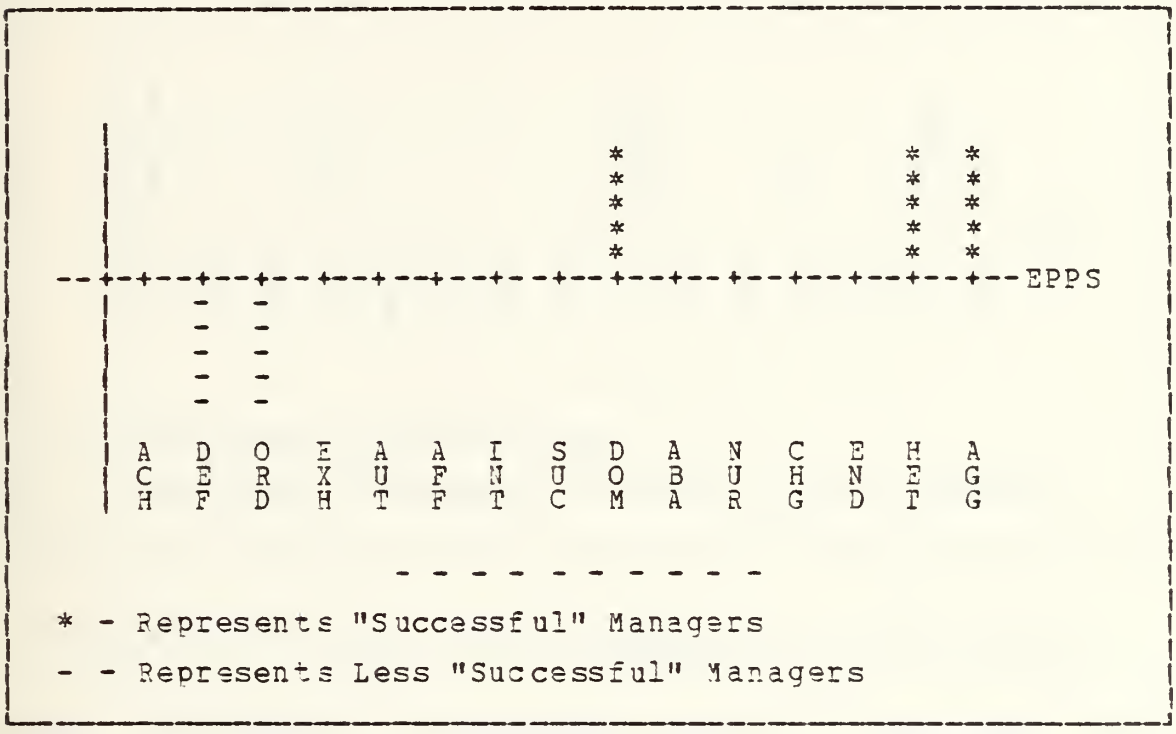

Figure 2.5 Public Utility Managers Personality Needs Profile.

reference. For this reason, Figure 2.5 is dimensionless. It shows the direction of the relative strengths exhibited by the Rawls study group but does not give the magnitudes of those strengths.

The Public Utility study seemed to differentiate between successful and unsuccessful managers much more than the AT&T study did. As Figure 2.6 shows, the researchers are in agreement in so far as needs for Dominance and Heterosexuality are indicated by both studies. However, Bray's study of AT&T managers indicated a significantly higher manifest need for Achievement than the norm, a trait which Rawls' study of Public Utilities managers did not

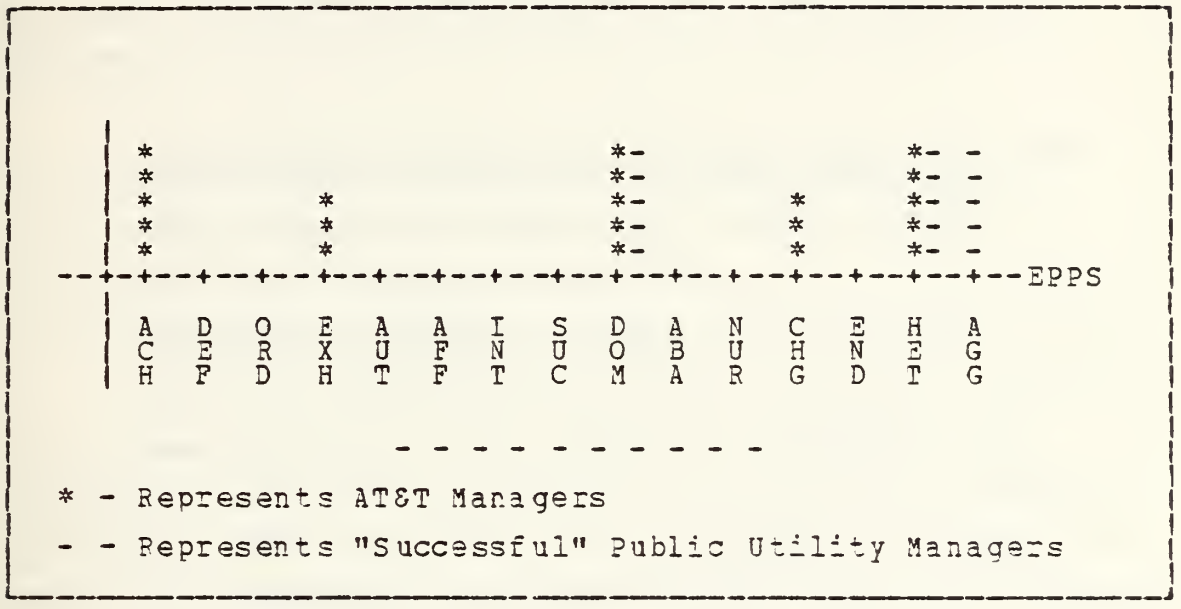

Figure 2.6 Public Utility Managers vs. AT&T Managers.

show. Additionally, Bray found exhibition and change needs high enough to mention and Rawls apparently did not. As mentioned earlier, Rawls found significantly higher deference and order needs for managers who were classified as less successful, whereas Bray found only slight differences between his study groups.

3. The Stanford MBA Study

Harrell's series of studies on male Stanford Business School graduates was based on the results of an initial eleven-instrument test battery and a follow-up questionnaire issued five years later. Of the fifty-five predictor variables originaly identified, thirteen were consistantly judged to be significant predictors of earning potential in each part of the study. This enabled Harrell to make the following generalizations about successful managers:

1. High earning managers work longer hours but they derive greater satisfaction from their work.
2. They have higher energy and interest levels.
3. They have strong personalities.
4. They share a feeling of self confidence and a life history of perceived success.

The last generalization is of particular interest. It is based entirely on the findings indicated by an instrument selected to measure these particular predictor variables. This instrument, the Richardson, Bellows, and Henry, Inc. Individual Background Survey (IBS), was designed in the early 1950's for the Standard Oil Company (New Jersey). According to Buros' Tests in Print, it is no longer in publication. In fact Harrell did not use the original edition of the survey, he and his associates used a revised edition with a similarly revised scoring criteria.

The survey was designed so that, in general, the higher the score on the IBS, the greater the perception of past success and expectation of future success on the part of the individual manager. Possible scores on Harrell's revision of the IBS ranged from -26 to +33. As Table I shows, Harrell found mean scores ranging from 7.1 to 9.9.

TABLE I

IBS Score Range

	Large Business		Small Business	
	Low Earners	High Earners	Low Earners	High Earners
M	7.2	8.6	7.1	9.9
SD	3.4	3.3	4.0	3.6

Both the lowest and the highest scores were achieved by MBA's employed by a small business; the low scores were from managers whose earnings were in the lower one third of the sample and the highest scores were achieved by those whose earnings were in the upper one third.

The reader will note that all the mean scores achieved by the Stanford graduates were positive values. This was interpreted by Harrell to signify that the people who are attracted to the field of management have some measure of self-confidence and a somewhat positive outlook for the future.

III. METHODOLOGY

A. THE SURVEY INSTRUMENTS

After much advice and deliberation, two very different instruments were chosen for this study: the Edwards Personal Preference Schedule (EPPS) [Ref. 16], and an Individual Background Survey (IBS) given as Appendix B. According to the handbook provided with the EPPS, it was designed "... for research and counseling purposes, to provide quick and convenient measures of a number of relatively independent normal variables." The IBS was based on an instrument developed in the early 1950's by Richardson, Bellows, Henry & Co., Inc. for the Standard Oil Company of New Jersey Employee Relations Department [Ref. 17]. The relative strengths and weaknesses of the two instruments and this researcher's rational for selecting each is discussed in the following paragraphs.

1. Edwards Personal Preference Schedule

Most researchers agree that the success record of personality tests and inventories in predicting managerial career performance is somewhat limited. However, according to McCormick and Ilgen [Ref. 7: p. 170],

> There is an almost universal assumption by personnel managers that the personality and interests of individuals can have a marked influence on their work performance and on the extent to which people adjust to their jobs.
> ... This is particularly true for jobs that require substantial amounts of personal contact with other people, as in some sales work, some supervisory and management activities, interviewing and the like.

If this is the case, it seems reasonable to believe that, over time, the people who remain in one of these fields would tend to display similiar personality characteristics. Examples of this have been given in several of the studies referred to earlier in this thesis.

There are two particularly popular theories of personality needs, a first presented by Murray and others [Ref. 18], and a second developed much later by Maslow [Ref. 19]. Murray presented a list of needs, some of which are given in Appendix A, that motivate individual behavior. In Murray's view, each of these needs is present to some degree in all individuals. It has been shown that these manifest needs can and do change over time [Ref. 2: Ch. 10]. Maslow proposed a hierarchy of needs that range from the most basic physiological needs, such as the need for food and shelter, to the most profound self-actualization needs. Maslow theorized that as the individual grows, he satisfies the needs roughly in sequence from the lowest level toward the highest. Very few individuals ever achieve the highest level of Maslow's hierarchy.

While similarities do exist between these two theories [Ref. 20], it is this researcher's opinion that Murray's theory is more useful for demonstrating personality differences among various occupational groups. A well-paid mechanic, educator, and politician might all be at roughly the same position on Maslow's hierarchy, but they would certainly display radically different manifest needs as measured by Murray's system.

A multiplicity of instruments designed to measure Murray's needs exist [Ref. 21 and 22]. This fact makes the selection of the correct instrument for a particular research project a formidable task. Because of an experience this researcher had with possible "faking" in an

earlier project, it was determined that a forced-choice inventory would be used. Once this decision was made, the literature selected the Edwards Personel Preference Schedule. This instrument is quite popular among researchers; it was cited in the majority of studies selected for comparison in this thesis. The Edwards Personal Preference Schedule has been in print for over twenty years and its stability over these two decades has been demonstrated [Ref. 23].

One unfortunate side-effect of the instrument's longevity is the lack of published general adult norms since 1959. A study conducted in 1975 cast some doubt on the current validity of the adult norms provided with the EPPS handbook [Ref. 24]. This survey demonstrated a definite shift in the expressed manifest needs of the sexes; that is, the differences found between male and female groups were not nearly as great as Edwards' original findings showed. The 1975 study also showed a pattern of need changes for both sexes which the authors attributed to societal changes.

An earlier study pointed out another possible pitfall to avoid when utilizing the EPPS [Ref. 25]. This study compared the measured personality needs of men with successful and unsuccessful marraiges to the general adult norms provided with the EPPS handbook and found that both groups differed from the published norms in the same direction. It was only when the researchers compared the scores of the groups to each other that differences began to emerge. This prompted the authors to caution future researchers against attributing differences found to selected group variables before insuring that appropriate groupings are made.

Unfortunatly college students are not a representative general adult sample. Therefore, while this researcher agrées that the figures published in the EPPS handbook are no longer current, the updated norms presented in Reference 24 are probably no more accurate than the general adult norms published with the EPPS and will therefore not be used in this study. However, since the purpose of this research is to measure similarities and differences among specific groupings, the methods presented in Reference 25 do apply and Edwards' original adult male findings form an appropriate norming tool.

2. RBH Individual Background Survey

Personal data as gleaned from a job application, solicited during an interview or both is used almost universally in the initial employment process. A survey of thirty-three large[3] industrial firms known to be conducting "research in areas related to the identification or enhancement of managerial talent" found that all thirty-three companies weighed biographical information and other personal data heavily in their hiring procedures [Ref. 26: pg. 30].

Owens and Henry, as quoted by Campbell and associates [Ref. 26: pg. 145], cited a number of advantages for the use of this type of information in predicting future job behavior, including:

1. The method is merely an extension of the typical application blank and is likely to be more acceptable than many tests.
2. Empirical validation of biographical items against actual managerial behavior assures that only job-related questions will be asked of a job candidate, thereby guarding against charges of willful discrimination against minority groups or

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[3] The firms included in this study all appeared in the Fortune 500 and employed 10,000 or more people.

"invasion of privacy" by tests designed to "explore the psyche."

Another text's discussion of biographical information centered on the high validity coefficients found in studies of the predictive value of these items [Ref. 7: pg. 189]. The authors reported that "in general, biodata have been found to be more predictive of job proficiency criteria than various types of tests are."

The Standard Oil Company of New Jersey conducted a long-term study in an attempt to validate tests and biographical inventories as predictors of managerial success [Ref. 26 and 27]. The stated purpose of the research was: first, to determine some measure of managerial success, and second, to find a way to predict success potential early in a manager's career. 443 managers completed a battery of tests and a background survey. The single predictor with the highest overall success rate was the Richardson, Bellows and Henry, Inc., Individual Background Survey.

This instrument was designed to collect biographical data and other personal and historical information and purportedly provides some measure of one's perception of past success and the amount of confidence in one's own future. It was later shown to be valid for predicting earnings for Harvard MBA's five years after college [Ref. 27: pg. 120]. A revision of the RBH Individual Background Survey was also used successfuly, as cited previously in this thesis, as a predictor in an extensive study of Stanford Business School graduates [Ref. 10-15].

B. THE POPULATION

Several populations were considered suitable for this thesis. One of the most promising was an organization called the Data Processing Management Association. Members

of this organization also made up part of the population for Couger, Zawacki and Oppermann's study which was cited earlier [Ref. 3]. The association's international headquarters in Chigago was contacted and a point of contact for three of the local chapters was obtained. The membership chairmen for the Monterey Bay and the San Jose Chapters were contacted in early June of 1982 by telephone; both men indicated that they were very interested in participating in the project. After some discussion, it was determined that the membership of the San Jose Chapter would make the most suitable population. According to the membership chairman, the San Jose chapter was composed primarily of more senior people, while the Monterey Bay Chapter members were predominatly programmers and systems analysts.

The initial response was rather limited which prompted this researcher to investigate other possibilities; fortunately, the San Jose membership chairman had an aquaintance who was a member of the San Francisco Bay Area Chapter of the organization. He agreed to add the San Francisco chapter membership to the original population.

All San Jose and San Francisco chapter DPMA members who attended their chapter's regularily scheduled monthly meetings in September and October 1982, were provided with an envelope (stamped and addressed to the researcher) containing a cover letter, the revised edition of the Individual Background Survey, and the Edwards Personal Preference Schedule with answer sheet. The members were asked to fill out the questionnaires, place all of the materials into the envelope provided and drop the envelope into a mailbox.

C. THE RESPONDENTS

The initial respondents were twelve members of the San Jose, CA chapter and seventeen members of the San Francisco, CA chapter of the Data Processing Management Association. This group was later supplemented by eight computer professionals employed by various concerns in Monterey, CA.

The population represented a cross-section of senior data processing professionals including analysts, project managers, various levels of supervisors, college professors, planners, vice-presidents, and company directors. A wide range of firms was represented ranging from major hardware and software houses, manufacturers, and research organizations to universities and city governments.

IV. FINDINGS

A. MANIFEST PERSONALITY NEEDS

The collective personality of the respondants, as measured by the Edwards Personal Preference Schedule, indicated a high need for Achievement, Exhibition, Dominance, Change, and Heterosexualty and a low need for Deference, Order, Abasement, Nurturance and Endurance.

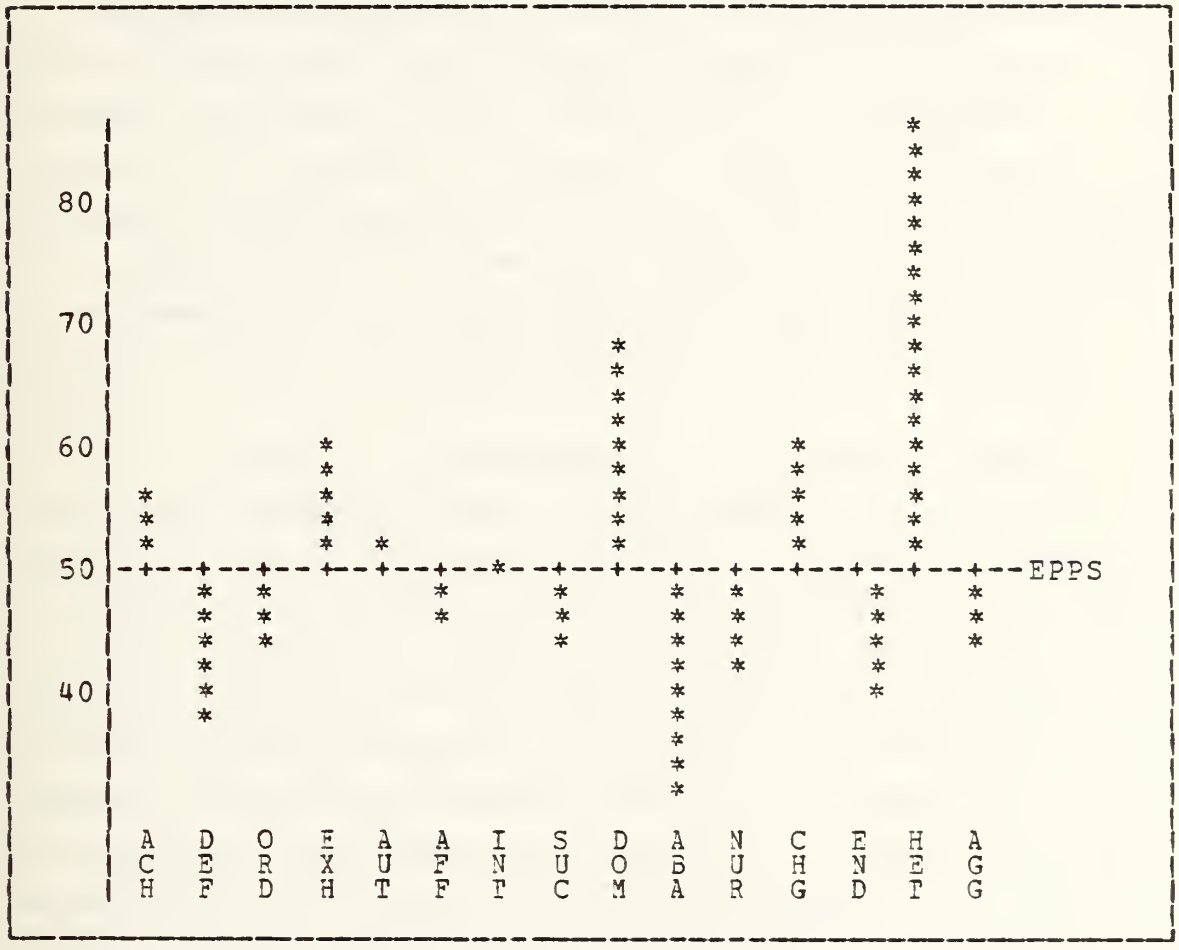

Figure 4.1 Needs of Respondents vs. General Population.

Figure 4.1 compares the manifest needs of the respondents to a general adult sample.

For comparison purposes, as with the Bray study [Ref. 2], a score of fifty was arbitrarily assigned to each of the fifteen measured personality variables. A separate conversion factor was then established for each variable and the mean scores achieved by the study subjects in each of the fifteen catagories were multiplied by the conversion factor to yield the score depicted in figure 4.1.

B. BIOGRAPHICAL DATA

The scores achieved on the RBH Individual Background Survey ranged from -9 to +16 with a mean of +5.4 and a standard deviation of 7.13. Since this biographical inventory was designed to measure a perception of past success and confidence in the future [Ref. 12], these scores would indicate that the average information systems manager, as represented by the participants in this study, has a positive outlook and confidence in his self and in his future.

In an attempt to cross-validate this claim, these Individual Background Survey scores were correlated with the personality needs measured by the EPPS by means of the .bd MINITAB utility available on the Naval Postgraduate School IBM 3033 AP computer. Table II shows that significant positive correlations were found between IBS score and measured manifest needs for Achievement and Dominance, and negative correlations between IBS score and need for Intraception, Succorance, and Abasement. These traits are indeed those of one with a strong personality. The high negative correlations between IBS score and Intraception, Succorance, and Abasement reflect a self-satisfied, rather independent individual who has no need to re-live the past.

TABLE II

Correlations: IBS Score and Personality Needs

	ACH	INT	SUC	DOM	ABA
IBS SCORE	.694	-.549	-.438	.538	-.642

At the same time, the high positive correlations between IBS score and Achievement and Dominance needs are those of one who is unafraid of the future and clearly support the claim that the IBS measures self-confidence.

C. PHYSICAL CHARACTERISTICS

Some additional information about the physical characteristics of the respondants was gleaned from the Individual Background Survey. They came in all shapes and sizes; they ranged in height from 5 feet 3 inches to 6 feet 4 inches and in weight from 110 to 240 pounds. Table III shows the range found by the survey in these catagories. All were native-born Americans, most were born in California but every region of the United States was represented as a birth-place. All of the respondents but one were college graduates and several had continued on to earn postgraduate degrees. They were single, married, widowed, and divorced. On the whole they seemed to like children, all who were married had at least one child. Many had served in the armed forces, with all levels of seniority represented.

The typical Computer Professional, according to the data gathered in this study, was a 39 year, old 5 foot 10 inch, 175 pound male. He was born in the western United States,

TABLE III

Physical Attributes

1. AGE

A.	25-29	8%
B.	30-34	16%
C.	35-39	32%
E.	40-44	12%
F.	45-49	16%
G.	50-54	16%
H.	55-60	0%

Average Age: 39.6 years

2. Height

A.	Under 60 Inches	0%
B.	60-62 Inches	0%
C.	63-65 Inches	8%
D.	66-68 Inches	16%
E.	69-71 Inches	52%
F.	72-74 Inches	16%
G.	Over 74 Inches	8%

Average Height: 5 ft. 10.5 in.

4. Weight

A.	Under 100 Pounds	0%
B.	101-120 Pounds	4%
C.	121-140 Pounds	12%
D.	141-160 Pounds	4%
E.	161-180 Pounds	36%
F.	181-200 Pounds	20%
G.	201-220 Pounds	8%
H.	Over 220 Pounds	16%

Average Weight: 175 lbs.

he had a college degree, he was married and he had one or two children. The typical respondent did not serve in the US Armed Forces; however of those who did, the majority were commissioned officers.

D. CORRELATIONS

The personality variables defined by the EPPS were correlated with certain physical and environmental variables again using the **MINITAB** utility available on the Naval Postgraduate School computer. As the reader can see from Table IV, several interesting correlations seem to exist between some of these traits and the subject's age, height, weight, and maritial status.

1. Age

Age was not an overriding factor; however two somewhat interesting correlations were found. The need for independance tended to increase and the need for endurance tended to decrease with age. These findings may result from the fact that older professionals are often rather secure in their positions and may not be as concerned about evaluations or performance ratings as thier younger associates.

2. Height and Weight

Physical size seemed to be the single most influential variable. According to the study, the larger a person got the more he needed not only to be the center of attention of the group, but also to control that group. Interestingly enough, while the desire to capture the attention of the group and influence it increased with physical size, the need to be a part of the group actually decreased with height and weight. In keeping with this, the levels of generosity, kindness and sympathy were also inversly proportional to physical size. Also, it seems that fat people needed more friends and could deal with change but showed little desire for sympathy and tolerated less abuse than skinny people.

TABLE IV

Correlations: Personality and Physical Variables

		AGE	HEIGHT	WEIGHT	M STATUS
H	ACHIEVEMENT	*	*	*	*
L	DEFERENCE	*	-.356	*	*
L	ORDER	*	*	*	*
H	EXHIBITION	*	.497	.802	.389
	AUTONOMY	.379	.330	.638	*
L	AFFILIIATION	*	*	-.320	*
	INTRACEPTION	*	*	-.461	*
	SUCCORANCE	*	*	-.416	*
H	DOMINANCE	*	*	.368	.732
L	ABASEMENT	*	*	-.491	-.563
L	NURTURANCE	*	-.413	-.493	-.387
H	CHANGE	*	*	.371	*
L	ENDURANCE	-.330	*	*	*
H	HETEROSEXUALITY	*	*	*	*
	AGGRESSION	*	*	*	*

H - indicates variables in which respondents scored significantly above the published norms.

L - signifies variables in which respondents scored significantly below the published norms.

* - signifies a correlation coefficient below |.30|

3. Maritial Status

Married men also displayed some need to be the center of attention and the greatest need to control the situation. They had learned to accept suggestions from others, but did not like to accept their share of the blame,

and had more trouble showing affection than the unmarried respondants.

V. DISCUSSION

The preceding chapters of this thesis have provided separate descriptions of computer programmers and systems analysts, managers from fields unrelated to information systems, and information systems managers. Men employed in these various fields were described in terms of various measurable personality characteristics and, to a lesser extent, other biographical information. This chapter is an attempt to compare these findings and determine if there is any basis for answering the central question posed by this study: Is the information systems manager more like his subordinates or his managerial peers?

A. PROGRAMMERS AND ANALYSTS

Studies based on Herzberg's theories have shown that all computer professionals exhibit very low social needs and correspondingly high growth needs [Ref. 3, 4, and 8]. These studies found that information systems managers, at least when viewed in terms of Herzberg's theories, tend to display characteristics more like the programmers and systems analysts who work for them than like other managers.

Another view of this subject, based on Murray's personality needs, presents a somewhat different picture [Ref. 5]. Figure 5.1 is a dimensionless graph formed by combining Figure 2.1 with an adaptation of Figure 4.1. This figure compares the findings of Woodruff's study to those of this thesis. Unfortunatly, a more exact comparison cannot be made because different test instruments were used in the two studies. However, Figure 5.1 can be used to show tendencies; and, while some similarities do appear, there are many more marked differences.

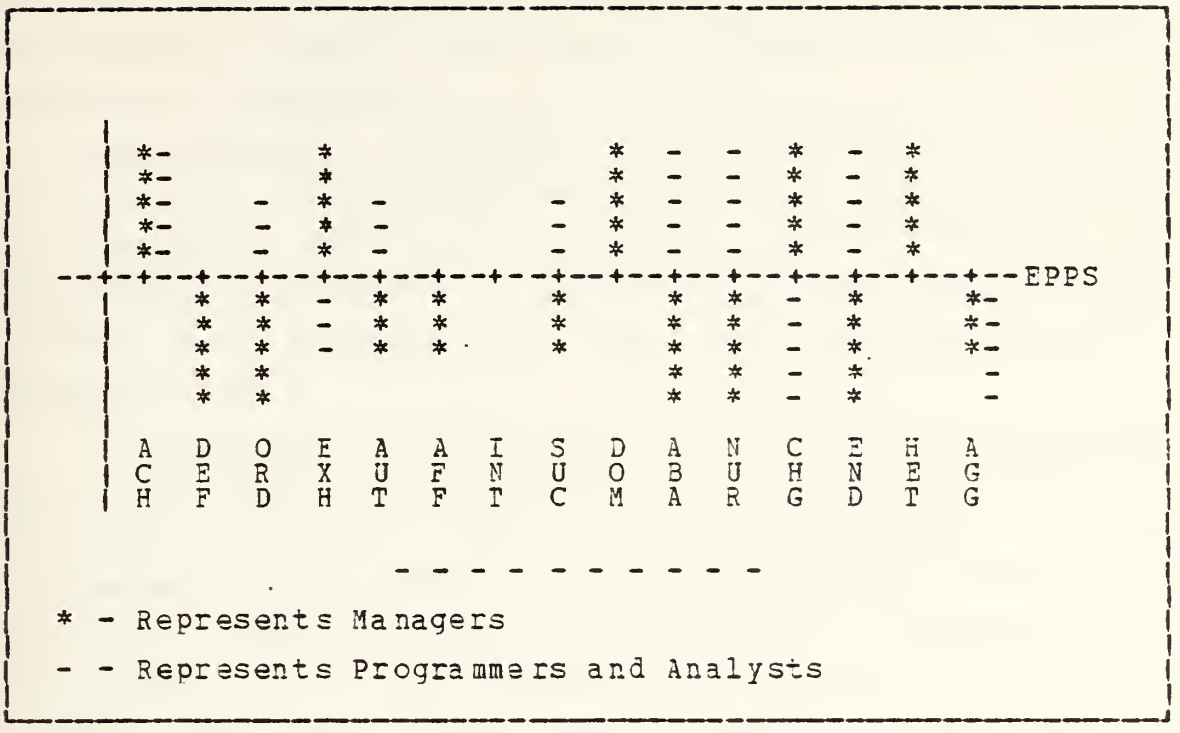

Figure 5.1 Managers vs. Programmers and Analysts.

Both study groups demonstrated Achievement needs that were above the norm, and Affiliation and Aggression needs that were below the norm. These findings are consistent with the high growth and low social needs found in the Herzberg-based studies and also appear to square well with one's intuition. It would appear then, at this superficial level of comparison, the findings of this thesis are in accord with Couger's earlier study. The similarity, however, ends at this point. Woodruff found a high manifest need for Order among the progammers and analysts he surveyed. This is not suprising given that a computer program is a set of logical steps assembled in an orderly fashion designed to accomplish one specific task. One would expect such a product to be the creation of an orderly mind. Information systems managers, on the other hand displayed

the low Order need that one requires if one is to cope with the constant interruptions that are a fact of life in the management profession.

The programmers exhibited little desire to be the center of attention, while the managers scored well above average in this trait. Again, these results are intuitivly acceptable; programmers and analysts have been shown to be "loners" while managers simply must have more out-going personalities.

The programmers and analysts scored above the published norm in the need for Succorance and Nurturance while the managers scored below the norm in these catagories. Perhaps programmers and analysts require more "managing" than originally thought. They want to be helped along when depressed or tired or in trouble. They need a little sympathy from time to time; and, it seems they also know when to provide comfort to others when the other is in some need. In comparison, managers appear to have less of a need for this type of consideration and are consequently less likely to recognize the need in others.

On the contrary, programmers and analysts require the time to complete a task once they have started it. They have a need for Endurance that is greater than average and much greater than that displayed by information systems managers. Once again intuition and experience are satisfied. It is not unusual for a programmer to become fixated on a project he is working on; he will work all hours until he completes the piece of code he has become obsessed with. The manager cannot afford to become entangled with one project; he cannot lose sight of even one of the many projects under his direction.

Other difference between programmers and analysts and their supervisors include those seen in the catagories of Dominance and Abasement. Programmers and analysts achieved average scores on the Dominance scale and slightly above

average scores on the Abasement scale; information systems managers scored well above average scores on the Dominance scale and well below average on the Abasement scale. Programmers and analysts are not natural leaders, in fact, they may feel somewhat timid in the presence of their supervisors. Managers, on the other hand, appear to be natural leaders who may have no such feelings of insecurity, in fact, they may enjoy heated discussions with their seniors.

B. OTHER MANAGERS

Turning now to comparisons with managers representing other professions, the next subsections will discuss the studies based on managers employed by AT&T and the public utilities managers. The Standford Business School graduate study will be discussed in the final section.

1. AT&T Managers

Figure 5.2, which is simply a juxtaposition of Figures 2.2 and 4.1, compares the manifest needs of the typical AT&T manager as described by Bray in Reference 2 to those of the computer professionals surveyed in this study. It presents a rather suprising result. In twelve of the fifteen catagories measured by the Edwards Personal Preference Schedule, the information systems managers polled in this study tended in the same direction from the norm as the managers who made up the AT&T study. That is, both sets of managers indicated high manifest needs for Achievement, Exhibition, Dominance, Chance, and Heterosexuality with low manifest needs for Deference, Order, Affiliation, Succorance, Abasement, Nurturance, and Endurance. The only catagory in which the two sets of managers really differed was in the Aggression scale.

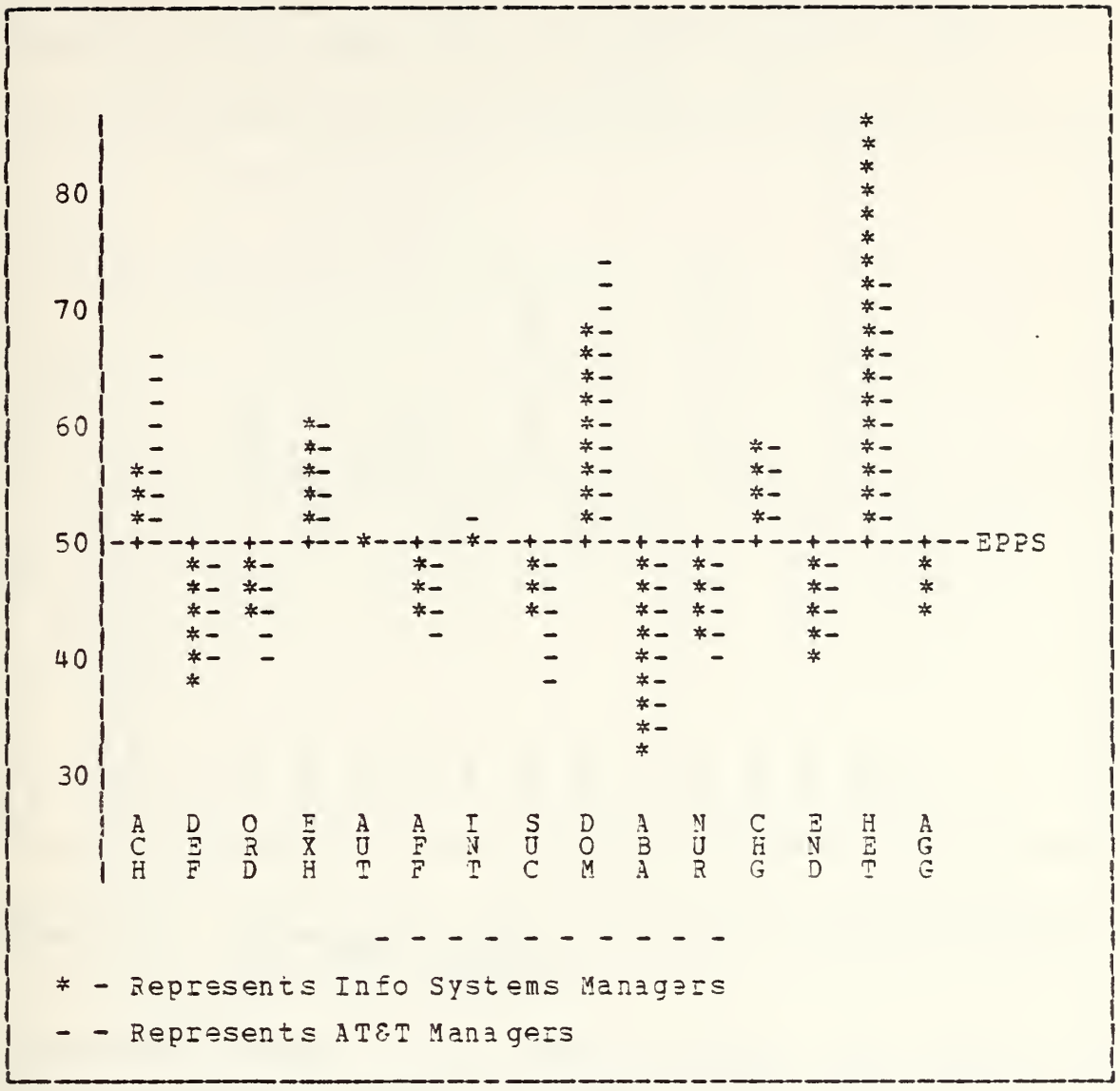

Figure 5.2 Information Systems Managers vs. AT&T Managers.

It was obvious to this researcher that this finding should be pursued further. Utilizing a method suggested by Rogers and his associates [Ref. 25], and used earlier in this thesis, a new figure, Figure 5.3, was generated by driving the mean scores achieved by Bray's cross-section of managers in each of the fifteen variables to 50. By multiplying each of the mean scores achieved by the

Information Systems Managers by the conversion factor generated in the above step, a clearer picture of the

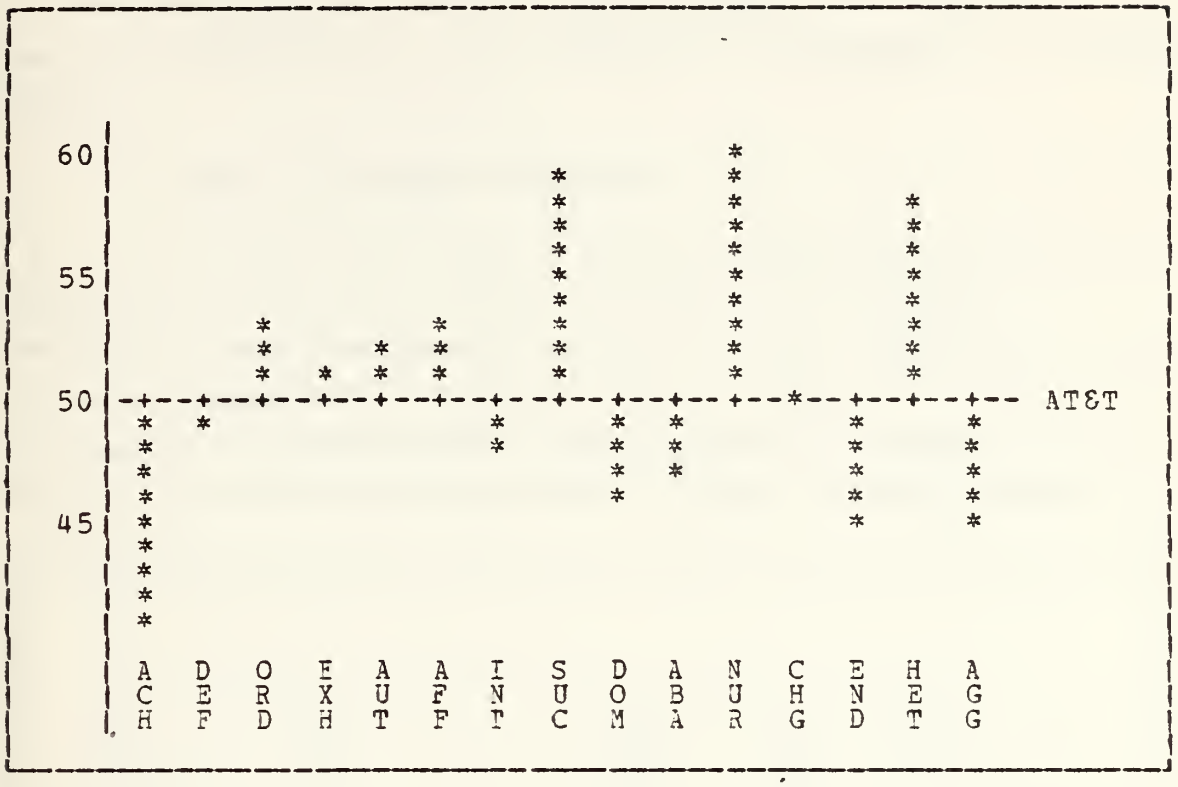

Figure 5.3 Alternative View: Information Systems Managers vs. AT&T Managers.

differences between the two groups emerges. The information systems managers surveyed achieved a lower score on the Achievement, Dominance, Abasement, Endurance, and Aggression scales; while the scoring higher on the Affiliation, Succorance, Nurturance, and Heterosexuality scales.

This alternate view of the data is significant. The reader may remember that this same device was utilized earlier in this thesis with somewhat different results. (See Figure 2.4.) When Bray's "fast starters" and "slow starters" were compared in this fashion, they appeared to be a much more homogeneous group. Thus, while clear

similiarities do exist among the various manifest needs of the managers employed by AT&T and those of the Information systems managers surveyed in this study, there remain definite differences in the degree of manifestation of those needs

2. Public Utilities Managers

The Rawls and Rawls study of managers employed by a small southern public utility diferentiated between successful and unsuccessful managers. The researchers found that the "successful" managers scored higher on the Dominance, Heterosexuality, and Aggression scales of the EPPS while the "less successful" managers scored higher on

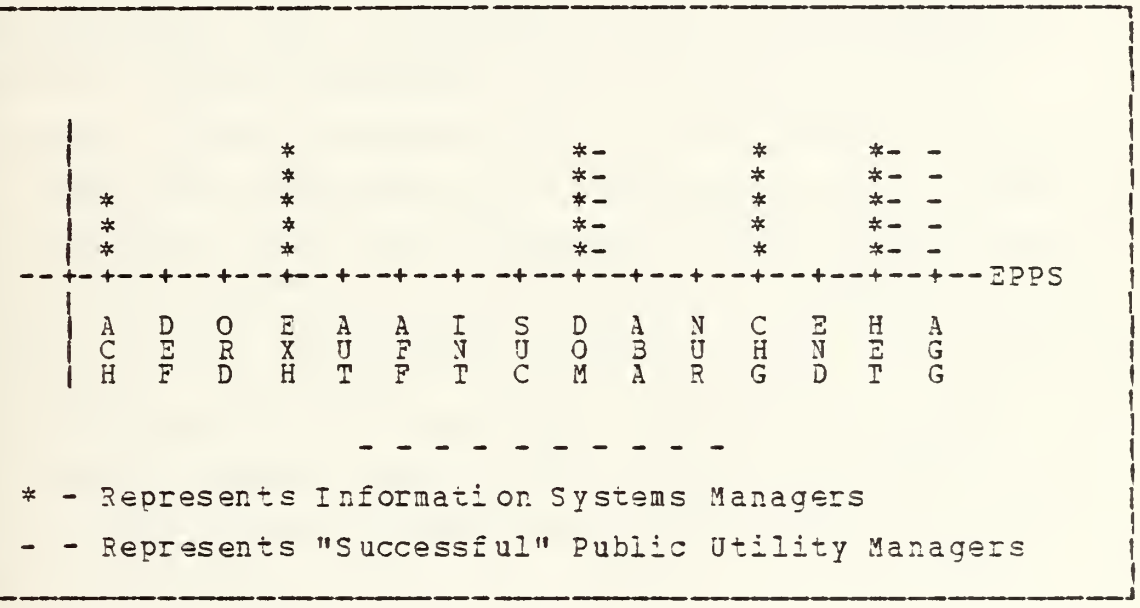

Figure 5.4 Information Systems Managers vs. Public Utilities Managers.

the Deference and Order scales. If these results could be shown to be true for all managers, they would bode well for the information systems managers surveyed in this study. They too scored above average on the Dominance and

Heterosexuality scales of the EPPS while scoring below the average on Deference and Order scales. However, they did not score particulaly high on the Aggression scale.

C. BIOGRAPHICAL INFORMATION

The fact that the information systems managers achieved scores on the Richardson, Bellows and Henry Individual Background Survey that indicated that they were, like other managers, rather well-adjusted confident individuals has already been reported. Table V is a tabular depiction of these findings.

The reader will note that the mean IBS score recorded for the Standford MBA's is not only slightly higher than the mean score achieved by the information systems managers group but also that the standard deviation is somewhat smaller. These differences may be attributed to two factors. First, the score given for the Stanford group is the mean score achieved by MBA graduates who were judged to be successful, while the information systems manager score is the mean achieved by a cross-section of members of that field. Second, The Stanford group was a much more coheasive population; they were all Stanford graduates of roughly the same age from the same MBA class. On the other hand, the information systems managers were a much more mixed group from vastly different backgrounds and of a wide range of ages.

TABLE V

IBS Scores: Information Systems Managers vs. Stanford MBA's

Info. Sys. Managers	Stanford MBA's
Mean	Mean
+5.42	+8.2
St. Deviation	St. Deviation
7.13	3.57

VI. SUMMARY AND CONCLUSIONS

This study examined personality and biographical data gathered from a group of information systems managers in an attempt to determine if these managers are more like their subordinates or their professional peers. A group of thirty-seven subjects employed in high-level computer-related managerial positions completed the Edwards Personal Preference Schedule and the RBH Individual Background Survey. The findings were presented and correlations between the results of the two surveys were made. Finally, the findings of this study were compared to published results from similiar studies conducted on computer programmers and systems analysts and on other managers.

Like most of us, the information systems manager defies characterization; it is difficult to make a flat statement defining his personality. While some common traits are shared by programmers and analysts and their managers, on balance there are many more differences than there are similarities. Clearly, when discussed in terms of Murray's Variables of Personality, information systems managers are very different from programmers and analysts.

Differences also exist between information systems managers and managers from other fields. However, these differences are not nearly as radical as those mentioned above; they tend to be a matter of degree, not direction. The research shows that, in terms of Murray's Variables of Personality, the study group of Information Systems Managers had more in common with other managers than they did with programmers and systems analysts. Additionally, based on the results of the Individual Background Survey, these men

shared a feeling of self-confidence and a positive outlook with other management professional.

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APPENDIX A

DEFINITIONS OF PERSONALITY NEEDS

1. DOMINANCE (DOM)
   a) Murray: To control one's human enviornment. To influence or direct the behaviour of Os by suggestion, seduction, persuasion, or command. To dissuade, restrain, or prohibit. To induce an O to act in a way which accords with one's sentiments and needs. To get O's to cooperate. To convince an O of the 'rightness' of one's opinion.
   b) Edwards: To argue for one's point of view, to be a leader in groups to which one belongs, to be regarded by others as a leader, to be elected or appointed chairman of committees, to make group decisions, to settle arguments and disputes between others, to persuade and influence others to do what one wants, to supervise and direct the actions of others, to tell others how to do their jobs.
   c) Jackson: Attempts to control his enviornment, and to influence or direct other people; expresses opinions forcefully; enjoys the role of leader and may assume it spontaneously.

2. DEFERENCE (DEF)
   a) Murray: To admire and support a superior O. To praise, honour, or eulogize. To yield eagerly to the influence of an allied O. To emulate an exemplar. To conform to custom.

b) Edwards: To get suggestions from others, to find out what others think, to follow instructions and do what is expected, to praise others, to tell others that they have done a good job, to accept the leadership of others, to read about great men, to conform to custom and avoid the unconvential, to let others make decisions.

c) Jackson: Not measured.

3. AUTONOMY (AUT)

a) Murray: To get free, shake off restraint, break out of confinement. To resist coercion and restriction. To avoid or quit activities prscribed by domineering authorities. To be independant and free to act according to impulse. To be unattached, unconditioned, irresponsible. To defy convention.

b) Edwards: To be able to come and go as desired, to say what one thinks about things, to be independant of others in making decisions, to feel free to do what one wants, to do things that are unconventional, to avoid situations where one is expected to conform, to do things without regard to what others may think, to criticize those in positions of authority, to avoid responsibilities and obligations.

c) Jackson: Tries to break away from restraints, confinement, or restrictions of any kind; enjoys being unattached, free, not tied to people, places, or obligations, may be rebellious when faced with restraints.

4. AGGRESSION (AGG)

a) Murray: To overcome opposition forcefully. To fight. To revenge an injury. To attack, injure

or kill an O. To oppose forcefully or punish an O.

b) Edwards: To attack contrary points of view, to tell others what one thinks about them, to criticize others publicly, to make fun of others, to tell others off when disagreeing with them, to get revenge for insults, to become angry, to blame others when things go wrong, to read newspaper accounts of violence.

c) Jackson: Enjoys combat and argument; easily annoyed; sometimes willing to hurt people to get his way; may seek to 'get even' with people whom he perceives as having harmed him.

5. **ABASEMENT (ABA)**

a) Murray: To submit passively to external force. To accept injury, blame, criticism, punishment. To surrender. To become resigned to fate. To admit inferiority, error, wrong-doing or defeat. To confess and atone. To blame, belittle or mutilate the self. To seek and enjoy pain, punishment, illness and misfortune.

b) Edwards: To feel guilty when one does something wrong, to accept blame when things do not go right, to feel that personal pain and misery suffered does more good than harm, to feel the need for punishment for wrong doing, to feel better when giving in and avoiding a fight than when having one's own way, to feel the need for confession of errors, to feel depressed by inability to handle situations, to feel timid in the presence of superiors, to feel inferior to others in most respects.

c) Jackson: Shows a high degree of humility; accepts blame and criticism even when not deserved; exposes himself to situations where he is in an inferior position; tends to be self-effacing.

6. ACHIEVEMENT (ACH)

a) Murray: To accomplish something difficult. To master, manipulate or organize physical objects, human beings, or ideas. To do this as rapidly, and as independantly as possible. To overcome obstacles and attain a high standard. To excel one's self. To rival and surpass others. To increase self-regard by the successful exercize of talent.

b) Edwards: To do one's best, to be successful, to accomplish tasks requiring skill and effort, to be a recognized authority, to accomplish something of great significance, to do a difficult job well, to solve difficult problems and puzzles, to be able to do things better than others, to write a great novel or play.

c) Jackson: Aspires to accomplish difficult tasks; maintains high standards and is willing to work toward distant goals; responds positively to competition, willing to put forth effort to attain excellence.

7. SEX (HET)

a) Murray: To form and further an erotic relationship. To have sexual intercourse.

b) Edwards: (HETEROSEXUALITY) (HET) To go out with members of the opposite sex, to engage in social activities with the opposite sex, to be in love with someone of the opposite sex, to kiss those of the opposite sex, to be regarded as physically attractive by those of the opposite sex, to

participate in discussions about sex, to read books and plays involving sex, to listen to or tell jokes involving sex, to become sexually excited.

c) Jackson: Not measured.

8. SENTIENCE (SEN)

a) Murray: To seek and enjoy sensuous impressions.

b) Edwards: Not measured.

c) Jackson: Notices smells, sounds, sights tastes, and the way things feel; remembers these sensations and believes that they are an important part of life; is sensitive to many forms of experience; may maintain an essentially hedonistic or aesthetic view of life.

9. EXHIBITION (EXH)

a) Murray: To make an impression. To be seen and heard. To excite, amaze, facinate, entertain, shock, intrigue, amuse or entice O's.

b) Edwards: To say witty and clever things, to tell amusing jokes and stories, to talk about personal adventures and experiences, to have others notice and comment on one's appearance, to say things just to see what effect it will have on others, to talk about personal achievements, to be the center of attention, to use words that others do not know the meaning of, to ask questions others cannct answer.

c) Jackson: Wants to be the center of attention; enjoys having an audience; engages in behavior which wins the notice of others; may enjoy being dramatic or witty.

10. **PLAY (PLA)**

a) Murray: To devote free time to various forms of amusement: sports, dancing, drinking parties, cards and other indoor games. To laugh. To make a joke of everything.

b) Edwards: Not measured.

c) Jackson: Does many things 'just for fun'; spends a good deal of time participating in games, sports, social activities, and other amusements; enjoys a joke and funny stories; maintains a light-hearted and easy-going attitude towards life.

11. **AFFILIATION (AFF)**

a) Murray: To draw near and enjoyably co-operate or reciprocate with anallied O : an O who resembles the S or likes the S. To please and win the affection of a cathected O. To adhere and remain loyal to a friend.

b) Edwards: To be loyal to friends, to participate in friendly groups, to do things for friends, to form new friendships, to make as many friends as possible, to share things with friends, to do things with friends rather than alone, to form strong attachments, to write letters to friends.

c) Jackson: Enjoys being with friends and people in general; accepts people readily; makes efforts to win friendships and maintain associations with people.

12. **SUCCORANCE (SUC)**

a) Murray: To have one's needs gratified by the sympathetic aid of an allied O. To be nursed, supported, sustained, surrounded, protected, loved, advised, guided, indulged, forgiven,

consoled. To remain close to a devoted protector. To have always a supporter.

b) Edwards: To have others provide help when in trouble, to seek encouragement from others, to have others be kindly, to have others be sympathetic and understanding about personal problems, to receive a great deal of affection from others, to have do favors cheerfully, to be helped by others when depressed, to have others feel sorry when one is sick, to have a fuss made over one when hurt.

c) Jackson: Frequently seeks the sympathy, protection, love, advice, and reassurance of other people; may feel insecure or helpless without such support; confides difficulties readily to a receptive person.

13. NURTURANCE (NUR)

a) Murray: To give sympathy and gratify the needs of a helpless O: an infant or any O that is weak, disabled, tired, inexperienced, infirm, defeated, humiliated, lonely, dejected, sick, mentally confused. To assist an O in danger. To feed, help, support, console, protect, comfort, nurse, or heal.

b) Edwards: To help friends when they are in trouble, to assist others less fortunate, to treat others with kindness and sympathy, to forgive others, to be generous with others, to sympathize with others who are hurt or sick, to show a good deal of affection toward others, to have others confide in one about personal problems.

c) Jackson: Gives sympathy and comfort; assists others whenever possible, interested in caring for

children, or the infirm; offers a 'helping hand' to those in need; readily performs favors for others.

14. **DEFENDANCE (DFN)**
    a) Murray: To defend the self against assault, criticism and blame. To conceal or justify a misdeed, failure or humiliation. To vindicate the Ego.
    b) Edwards: Not measured.
    c) Jackson: Readily suspects that people mean him harm or are against him; ready to defend himself at all times; takes offense easily; does not accept criticism readily.

15. **HARMAVOIDANCE (HAR)**
    a) Murray: To avoid pain, physical injury, illness and death. To escape from a dangerous situation. To take precautionary measures.
    b) Edwards: Not measured.
    c) Jackson: Does not enjoy exciting activities, especially if danger is involved; avoids risks of bodily harm; seeks to maximize personal safety.

16. **ORDER (ORD)**
    a) Murray: To put things in order. To achieve cleanliness, arrangement, organization, balance, neatness, tidiness and precision.
    b) Edwards: To have written work neat and organized, to make plans before starting on a difficult task, to have things organized, to keep things neat and orderly, to make advance plans when taking a trip, to organize details of work, to keep letters and files according to some system, to have meals organized and a definite time for eating, to have

things arranged so that they run smoothly without change.

c) Jackson: Concerned with keeping personal effects and surroundings neat and organized; dislikes clutter, confusion, lack of organization, interested in developing methods for keeping materials methodically organized.

17. CHANGE (CHG)

a) Murray: Lack of fixation. To have no fixed habitat, to enjoy moving from place to place, to wander and travel. To have few permanent attachments. To seek novelty, experiment, adventure. To be fickle in love. To enjoy new sights, new books, new people, new ideas.

b) Edwards: To do new and different things, to travel, to meet new people, to experience novelty and change in daily routine, to experiment and try new things, to eat in new and different places, to try new and different jobs, to move about the country and live in different places, to participate in new fads and fashions.

c) Jackson: Likes new and different experiences; dislikes routine and avoids it; may readily change opinions or values in different circumstances; adapts readily to changes in enviornment.

18. ENDURANCE (END)

a) Murray: To show persistence of effort.

b) Edwards: To keep at a job until it is finished, to complete any job undertaken, to work hard at a task, to keep at a puzzle or a problem until it is solved, to work at a single job before taking on others, to stay up late working in order to get a job done, to put in long hours of work without

distraction, to stick at a problem even though it may seem as if no progress is being made, to avoid being interrupted while at work.

c) Jackson: Willing to work long hours; doesn't give up quickly on a problem; persevering, even in the face of great difficulty; patient and unrelenting in his work habits.

19. **INTRACEPTION (INT)**

a) Murray: (Paraphrased) To be subjective, imaginative, fanciful, somewhat innaccurate. To be personal in one's dealings. To be impractical, connctative in speech, metaphysical. To be partial in one's opinions. To be warm and passionate, unreasonable, in action, sensitive. To be egocentric, individualistic, tender-minded. To be deductive, intuitive in one's observations, artistic or religious, psychologically penetrating, idealistic, or monistic.

b) Edwards: To analyze one's motives and feelings, to observe others, to understand how others feel about problems, to put one's self in another's place, to judge people by why they do things rather than by what they do, to analyze the behavior of others, to analyze the motives of others, to predict how others will act.

c) Jackson: Not measured.

20. **UNDERSTANDING (UND)**

a) Murray: To ask or answer general questions. To be interested in theory. To analyze events and generalize. To participate in discussion and argument. To emphasize logic and reason. To state opinions precisely. To make thought correspond with fact. To have deep interest in

abstract formulations. To be interested in science, mathmatics and philosophy.

b) Edwards: Not measured.

c) Jackson: Wants to understand many areas of knowledge; values synthesis of ideas, verifiable generalization, logical thought, particularly when directed at satisfying curiosity.

21. COGNITIVE STRUCTURE (COG)

a) Murray: Not explicitly defined.

b) Edwards: Not measured.

c) Jackson: Does not like ambiguity or uncertainty in information; wants all questions answered completly; desires to make decisions based upon definite knowledge, rather than upon guesses or probabilities.

22. IMPULSIVITY (IMP)

a) Murray: Not explicitly defined.

b) Edwards: Not measured.

c) Jackson: Tends to act on the 'spur of the moment' and without deliberation; gives vent readily to feelings and wishes; speaks freely; may be volatile in emoticnal expression.

23. SOCIAL RECOGNITION (SOC)

a) Murray: Not explicitly defined.

b) Edwards: Not measured.

c) Jackson: Desires to be held in high esteem by acquaintances; concerned about reputation and what other people think of him; works for the approval and recognition of others.

APPENDIX B

INDIVIDUAL BACKGROUND SURVEY

DPMA Member:

The envelope you have been given contains two questionaires: a background survey and a preference schedule. The Individual Background Survey is based on an instrument developed in the early 1950's by Richardson, Bellows, Henry & Co., Inc. for the Standard Oil Co. of New Jersey Employee Relations Department. The Edwards Personal Preference Schedule also dates from the early 1950's; it was developed by Allen L. Edwards of the University of Washington. Both instruments are being circulated today to collect data for a Master's Thesis on the personal traits of High-level Computer Professionals. The researcher is Lt. Tom Machak, USN, who is a candidate for a Master's Degree in Information Systems Management at the Naval Postgraduate School in Monterey, Ca.

I do hope you will take the time to complete these questionaires; the findings should prove useful to information services managers like yourself, and they should help improve the quality of future management personnel decisions.

Your participation is, of course, entirely voluntary, and your anonymity will be strictly maintained.

Firm

Position

Place of birth

Height

Weight

INDIVIDUAL BACKGROUND SURVEY (REVISED JULY 1982)

Directions

This survey asks questions about your personal history -- activities of yourself and your family, things you have done, things you like or dislike and so on. Each statement or question is followed by four or five possible choices or answers, one of which will apply to you more than any of the others. Please read each statement or question carefully, then read all of the possible choices or answers. For each statement or question, select the one choice or answer that most nearly applies to you by circling the letter in front of it. Answer every question. Work rapidly. Do not spend too much time on any one question.

1. How many persons, other than you yourself, are dependent upon you for all or most of their support?

   a) None

   b) One

   c) Two or three

   d) Four or five

   e) More than five

2. How many really close friends did you have during your last year of formal education (either high school or college?)

   a) None

   b) One or two

   c) Several

   d) Many

   e) Almost everyone in my class was a close friend

3. How old were you when you earned your first money on a steady job (including a steady part-time or summer job?)

   a) Younger than eleven

   b) Eleven to thirteen

   c) Fourteen to sixteen

   d) Sixteen to eighteen

   e) Over eighteen

4. In what way will you probably do more for your children than your father did for you?

   a) Give them a better standard of living (clothes, food, home)

   b) Give them more opportunity to study, art, music, literature, and other leasure-time activities

   c) Give them more financial support

   d) Give them more consideration and affection

   e) Something else

5. How old are the majority of your good friends today?

   a) About my age as a rule

   b) About three to five years younger than me

   c) About three to five years older than me

   d) No consistent age pattern

6. Where do you and your friends most often get together?

   a) At my home

   b) At a friend's home

   c) At a church or club

   d) At a theatre, restaurant or other public place

   e) None of these

7. When are you most likely to have headaches?

   a) When I am trying to concentrate hard on doing something right

   b) After one of "those" nights

   c) After driving or looking at a strong glare

   d) When I don't get to eat on time

   e) I practically never have headaches

8. Which one of these statements best describes your childhood family situation?

   a) I had an unusually happy home-life

   b) I had an average home-life

   c) I had an unhappy home-life, because my parents did not get along with each other

   d) I had an unhappy home-life because I did not get along with my parents

9. How do you feel about the time you have to do your work?

a) I have time for everything without feeling pushed

b) I wish I had a little more time to plan and think

c) I find it necessary to keep pushing to get everything done

d) I find it very hard to do what is expected of me in the time available

e) I never seem to have enough time to do everything

10. What parts of your childhood would you like to re-live?

a) I would like to re-live the early dating period

b) I would like to re-live the period before I started school

c) I would like to re-live high school or college

d) Childehood was fine, but living it over again doesn't interest me

e) I dislike even thinking about my childhood

11. From your past experience, which one of these factors do you feel has been the most important for your success?

a) My ability to get along with my co-workers

b) My ability to get along with my supervisors

c) My ability to organize details of my work

d) My skill and experience

e) Something else

12. Which best describes your feelings when you last made a "speech" in public?

a) I did not make a good speech because of nervousness

b) I was nervous, but the presentation was not affected

c) I felt at ease, but I could have given a better talk

d) I felt perfectly at ease and delivered a good speech

e) I have never made a public speech

13. How many accidents have you had while driving a car or truck?

a) I have never had an accident

b) One or two

c) Three or four

d) Five or more

e) I do not drive

14. How many friends have you made in the last year?

a) I have no need to make new friends

b) One or two

c) Three to five

d) Six or more

e) I can't remember exactly

15. How do you usually act when you are angry?

a) I storm around for a while letting off steam

b) I try not to show that I am angry at all

c) I never let my temper get the best of me

d) I talk it over with someone

e) I try to keep away from everyone for awhile

16. Where did most of your spending money come from during the years you were in high school?

a) An allowance from my family

b) My own earnings

c) My own inheritance

d) Partly from allowance, partly from earnings

e) I didn't have much spending money

17. While in school, in what way did you like to have your accomplishments become known.

a) Announced to the class or group

b) Announced to myself only

c) Having my parents notified

d) Published in my school or local paper

e) I never had many accomplishments in school

18. When teams were being chosen, when were you picked?

a) Near the first

b) Around the middle

c) Near the end

d) I was usually one of those doing the choosing

e) I very seldom had time to play games

19. During your school years, which of the following were you a member of? (Mark ALL that apply.)

a) Athletic team

b) Social fraternity

c) School club or group (e.g., debating team, political science club, school band)

d) Honor roll

e) I never had an opportunity to be a member of these groups while in school

20. What was the highest rank you reached in the Boy Scouts of America?

a) Tenderfoot or Second Class Scout

b) First Class Scout

c) Star or Life Scout

d) Eagle Scout

e) I did not belong to the Boy Scouts

21. How old were you when you first learned to swim?

a) Under ten

b) Ten to thirteen

c) Fourteen to sixteen

d) Seventeen or over

e) I never learned to swim

22. During your last two years in high school, about how many hours a week did you spend on athletics?

a) None

b) One to four

c) Five to nine

d) Ten to fourteen

e) Fifteen or more

23. During your school years, how often did your parents include you in their leisure-time activities?

a) Most of the time

b) Frequently

c) Occasionally

d) Rarely

e) Never

24. How old were you when you graduated from high school?

a) Younger than fourteen

b) Fourteen to sixteen

c) Seventeen to nineteen

d) Twenty or older

e) I did not graduate from high school

25. How good is your health?

a) Poor -- I need rest or medical treatment

b) Fair -- I can work regularly, but I don't feel quite right all the time

c) Good -- as good as most people

d) Excellent -- I can tackle any job

e) Perfect -- I can drive hard on any job

26. To whom did you usually go for advice on important matters when you were about sixteen years old?

a) Friends of my own age

b) My father (or male guardian)

c) My mother (or female guardian)

d) A teacher or a minister

e) Somebody else

27. How many times during the past five years have you held a position as president, captain or chairman of any club, team, committee or study group.

a) Never

b) Once

c) Two or three times

d) Four or five times

e) More than five times

28. Where would you belong in a list of 100 typical people in the kind of job you can do best?

a) In the top 5%

b) In the upper third (but not in the top 5%)

c) In the middle third

d) In the lower third

e) I don't know

29. At which of the following are you least effective

a) Face-to-face interviews

b) Written reports

c) Group discussions or conferences

d) Lectures or speeches to groups

e) Telephone conversations

30. Which of these has given you the least difficulty on any job you have held?

a) Lack of friendliness of fellow workers

b) Not being as fast as the other workers

c) Not knowing the job well

d) The boss' criticism

e) None of these

31. Which of the following best describes what you usually do in making important decisions?

a) Take time to check with my boss

b) Make the decision and inform my boss later

c) Make the decision as if it were a routine matter

d) Put the problem up to those affected by the decision

e) Decision-making is not my responsibility

32. What do you typically do at a conference?

a) Act as chairman or conduct the meeting

b) Report on materials prepared in advance

c) Ask questions

d) Take a leading role in the discussion

e) Remain relatively inactive but try to learn from the discussion.

33. What was the highest grade or rank you attained in the Armed Forces?

a) Private or seaman apprentice

b) Non-commissioned or petty officer

c) Warrant officer

d) Commissioned officer

e) I was never a member of the armed forces.

If you are married, please answer the following items.

34. How far did your spouse go in school?

a) Completed eighth grade or less

b) Some high school, but did not finish

c) Graduated from high school

d) Attended college

e) College graduate or beyond

35. To what extent do your children agree with your ideas in general?

a) They rarely disagree with me

b) We sometimes have disagreements but not often

c) We disagree quite often

d) Not at all, they almost never agree with me

e) I have no children or, they are very young

36. Which one of the following does your spouse most often do when you discuss your business problems.

a) Listens attentively to the entire discussion

b) Asks intelligent questions

c) Helps take my mind off business by leading the discussion to something else

d) Gives suggestions as to what I can do

e) Something else

37. What kind of job do you think your spouse would like most to see you hold five years from now?

a) A sales supervisory job

b) A job like my present one with normal salary increases

c) A supervisory job not dealing necessarily with sales

d) A job in some other geographical location

e) Something else

38. Which best describes your spouse's attitude about your present living quarters.

a) Would like larger quarters

b) Thinks we need help with care of the quarters

c) Satisfied with what we have

d) Would like to move to another community or neighborhood

e) Would like to live in another house or apartment in the same neighborhood

39. How often do you and your spouse generally go out together for entertainment in a month?

a) Less than once a month

b) About once a month

c) Two to three times a month

d) Four to five times a month

e) More than five times a month

40. How well do your children get along with each other?

a) I have no children

b) I have only one child

c) They get along very well, on the whole

d) They quarrel occasionally

e) They always seem to be disagreeing about something

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